Memorandum

MIAMI-DADE COUNTY

Date: October 11, 2007

HPSC
Agenda Item No. 7(E)

To: Honorable Chairman Bruno A. Barreiro
and Members, Board of County Commissioners

From: George M. Burgess
County Manager

Subject: Report Relating to Fire Wells Outside the Urban Development Boundary

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This report was prepared in response to questions at the July 19, 2007 Health and Public Safety Committee meeting during a presentation by the Miami-Dade Fire Rescue Department. Specifically, information was requested related to funding strategies to provide means to prevent catastrophic fire damage to residences outside of the Urban Development Boundary (UDB) which, due to remoteness, lack adequate water supply for fire protection in residences outside of the Urban Development Boundary (UDB). Additionally, a resolution sponsored by Commissioner Dennis Moss is directing a feasibility study be conducted on this matter. The following information responds to the direction of the resolution as well as previous discussions at the Health and Public Safety Committee.

Background

On May 5 2007, a residential fire outside the UDB resulted in one of the occupants losing her life. In this particular case, the fire was initially reported as fully engulfing the home; therefore, regardless of how quickly Miami-Dade Fire Rescue (MDFR) units could have responded there would have been no change in the outcome. Response time is critical in those situations in order to prevent loss of life and property. In this incident Tanker 60, the closest MDFR response unit, was out of quarters responding to a vehicular accident at SW 216 St. and Krome Avenue. The next closest unit, Engine 52 was dispatched from quarters at 12105 Quail Roost Drive, approximately 8.6 miles away. Engine 52 was the first to arrive 13 minutes from the time the unit was dispatched and 14 minutes from the time the call was received.

Another incident on September 2, 2007, required MDFR's response to a similar residential fire outside the UDB. This fire was also reported as fully engulfing the home. The structure was over 5,000 square feet and quickly exhausted the initial responding suppression units' water supply. The closest known available water source was a well which was approximately one-half mile away. Due to the size of the structure, a total of 14 suppression units were eventually dispatched to the call.

There are approximately 900 homes in Miami-Dade County located outside the UDB. Some homes have existing wells that are in place primarily for agricultural purposes and are insufficient for a suitable water supply for fire protection. Fire hydrants, the primary source of water used for firefighting operations throughout Miami-Dade County, are non-existent outside the UDB. Neither the Miami-Dade Water and Sewer Department (WASD) or MDFR, the two county departments that primarily utilize or manage water resources track the number of privately-owned wells outside the UDB.

On an average structural fire response, MDFR arrives with approximately 1,000 gallons of water. It should be noted that relatively low water usage is attributed to rapid response and aggressive fire

attack procedures followed by MDFR. The amount of available water on trucks is minimally acceptable to control and extinguish a large "working fire" even in a small structure. The National Fire Protection Association (NFPA) provides consensus codes and standards for fire prevention followed by fire departments worldwide. NFPA standards establish the minimum required fire flow (available water) at 1,750 gallons per minute for residential structures. This may only be accomplished by accessing an adequate water supply (hydrant or powered well).

Ideally, in order to provide a water supply that meets the spacing recommendation by the NFPA for fire hydrants, the spacing between fire wells in the UDB should not exceed 500 feet. Realistically however, the installation of fire wells should be within a reasonable distance from each residence in order to minimize the amount of hose line, and therefore time needed to extinguish the fire. The exact number required cannot be determined based upon the current available information.

In order to ensure the ability to utilize fire wells when necessary, a maintenance, testing and repair program would have to be developed. If the fire wells are not properly maintained and fail to perform properly during an actual incident, the lack of water may result in a loss of life and property. Fire wells must be tested on a bi-annual basis at a minimum of two hours for each test. Fire wells are tested upon installation, but over time can experience various problems such as rocks and sand mixing with the well water, access problems due to overgrowth of vegetation, and physical damage due to vandalism and/or vehicular contact. Ongoing testing, flushing and maintenance of the wells should not be performed utilizing existing MDFR apparatus. Rocks or sand entering the system may result in damage to or the destruction of the vehicle's fire pump. Additionally, this would require having an MDFR suppression unit and personnel out of service and unable to respond to calls within their primary response zone during that time frame.

Commissioner Moss's resolution includes the review of fire well alternatives such as dry hydrants and dry wells. Dry hydrants are vertical pipes attached to other pipes with direct access to an existing water source, such as a pond or canal; they are not viable in areas that have no access to an external water source. Dry wells are subsurface storage facilities that receive and temporarily store stormwater runoff. In a dire emergency, dry wells could be utilized when filled to capacity. However, a lack of rain would defeat the purpose of the well and again, any matter within the runoff water could possibly damage or destroy the fire pumps. Since the primary concern is to overcome an insufficient or unavailable water supply for firefighting purposes, the installation of dry wells would not be cost-effective. The possibility of contamination also exists if vandals used the dry wells or hydrants to dispose of chemicals that could harm the groundwater and surface water bodies.

Fiscal Impact

Although fully operational fire wells would improve accessibility to a water supply to properly respond to structure fires, there are significant capital costs associated with their installation. The cost of installing

a fire well can range from $10,000 to $50,000, based upon square footage of the structure, occupancy classification, and the proximity of exposures in accordance with NFPA 1142 (see attachment). Based upon this information, overall cost estimates associated with the installation of these wells can range from nine million ($9,000,000) to forty-five million dollars ($45,000,000) if all 900 identified homes are given consideration.

There are also recurring costs associated with regular maintenance and testing of the wells. Maintenance costs may range from $500 to $1,100 per required session; however, there may be an offset derived from insurance premium reduction which would benefit the homeowner, but does not result in costs savings to the County. Based upon these facts, maintenance costs may range from a low of $450,000 to a high of almost $1,000,000 annually.

The South Florida Water Management District (SFWMD) has advised that no permit is required under Rule 40E-2.041, F.A.C., for the following water uses only:

(1) Water used strictly for domestic use at a single family dwelling or duplex provided that the water is obtained from one withdrawal facility for each single family dwelling or duplex.
(2) Water used strictly for firefighting purposes, and
(3) Water used at a single family dwelling or duplex including but not limited to home lawn and ornamental irrigation, car washing, and other incidental uses provided that the water is obtained from one withdrawal facility for each single family dwelling or duplex.

Per SFWMD requirements, the formality of a letter from the County ensuring that wells are designated for firefighting purposes only will be required. If the County is unable to verify that the fire wells will be used strictly for firefighting purposes, the additional cost of permitting will have to be added to the overall expense.

The Fire Rescue Department has submitted a request in the County's 2008 state legislative package to amend Florida State Statute 403.885 related to the Water Projects Grant Program to include residential water wells outside of the UDB. This legislative change will allow the County to apply to the state for grant funds that would help implement some of the solutions in this report. The Fire Department will also continue to seek other grant sources; otherwise, the cost of the County providing this service is prohibitive.

Some alternatives for funding include the business community and residential customers. The costs of installation, testing and maintenance could be shared by the individuals or companies benefiting from this service. Building permits outside the UDB may include a requirement for applicants with the intent to plat or develop a single family home on one acre or greater to install fire wells will alleviate the need for a portable water supply as is currently provided at most fires outside the UDB. Communities may also consider establishing a special taxing district to pay for the installation of these types of wells.

Assistant County Manager